

"This did not prevent medical speculators from opening an institution in Berlin for inhaling oxygen, where it is now being sold at 7*d.* the cubic foot, while oxygen water is sold at 2*d.* the bottle. As water of 0° does not absorb 4 per cent. of its volume, a half-litre bottle contains less than 20 cb.m., or 0.007 grammes of this gas! It seems incredible that such a dose should be expected to produce any effect whatever. Just as travellers are recommended to provide themselves with concentrated food, those who wish to climb the highest mountain tops, or by means of balloons reach great heights, where the thinness of the atmosphere might cause them dangerous inconveniences, are advised to use pure oxygen as a concentrated means of respiration.¹ P. Bert² exposed himself and others in proper apparatus, to degrees of rarefaction of air, which far surpassed that of the greatest heights ever reached by man. The want of breath and symptoms of suffocation which ensued, when the barometer stood at from 300 to 250 mm., were, according to his account, at once relieved by one breath of pure oxygen. A mixture of the same with atmospheric air proved even more effectual than the pure gas, and, on an aerial voyage which the late MM. Crocé Spinelli and Sivel undertook from Paris on the 22nd of March, 1874, they provided themselves with mixtures containing 45 and 75 per cent. of oxygen to 55 and 25 per cent. of nitrogen. They were enabled by the help of this gas to make valuable physical observations,³ at heights of more than 6,000 metres, leisurely and without any bodily inconvenience; and although Glaisher had succeeded in reaching still greater heights without this assistance, oxygen offers a means of gaining strata hitherto inaccessible."

These words, however, were scarcely written when the newspapers announced the death of the courageous navigators on a new aerial voyage; suffocation appears to have set in so suddenly as to incapacitate them at once from using their respiratory apparatus.

The physiological applications of oxygen form the bridge to some considerations on the practical uses of ozone, the discovery of which had been greeted by exaggerated hopes.

A. OPPENHEIM.

SOCIETIES AND ACADEMIES

LONDON

Chemical Society, Feb. 17.—Prof. Abel, F.R.S., president, in the chair.—The president announced that Mr. James Duncan had presented the Society with a most life-like and spirited marble bust of Dr. Hofmann. He then called upon Prof. Frankland to deliver his lecture "On some points in the analysis of potable waters." A report of this we give on another page.—A full discussion of the variation in purity of the water supplied during the past eight years by the various London companies followed, illustrated by most excellent diagrams, and the lecturer concluded by pointing out some of the objections to the other well-known processes employed for water analysis.

Zoological Society, Feb. 15.—Prof. Mivart, F.R.S., in the chair.—Mr. Slater exhibited the parrot called in Tschudi's "Fauna Peruana" *Conurus illigeri*, and observed that it had been certainly wrongly determined. Mr. Slater was of opinion that the bird belonged to a species hitherto unrecognised, and proposed to call it *Ara coultoni*, after M. Coulon, of Neuchatel, who had sent the specimen for exhibition.—Dr. Cobbold, F.R.S., exhibited and made remarks on a Parasite (*Echinorhynchus*), obtained from the Tamandua Anteater, which had died in the Society's menagerie.—Mr. W. K. Parker, F.R.S., read the second portion of his memoir on Ægithognathous Birds.—A communication was read from the Rev. O. P. Cambridge, in which he described a new order and some new genera and species of Arachnida from Kerguelen Island, from specimens collected by Mr. Eaton during the Transit of Venus Expedition.—Mr. G. French Angas communicated descriptions of four new species of land shells from Australia and the Solomon Islands, which he severally proposed to name *Helix moresbyi*, *Helix ramdeni*, *Helix beatrix*, and *Helix rhoda*. Mr. Angas also made some remarks on the nomenclature of *Helix angasiana* of Pfeiffer, and *Helix bitanata* of Cox.—Mr. Slater read some notes, by himself and Mr. Salvin, on some of the Blue Crows of America, taken from specimens lately examined, and pointed

out certain changes which it would be necessary to make in the nomenclature of the group adopted in their "Nomenclator Avium Neotropicalium."

Geological Society, Feb. 2.—Mr. John Evans, F.R.S., president, in the chair.—Edward Richard Alston, David Corse Glen, Thomas Vincent Holmes, William G. M'Murtrie, Charles Bine Renshaw, Robert Drysdale Turner, and George Ferris Whidbourne, were elected Fellows of the Society.—Evidence of a carnivorous reptile (*Cynodrakon major*, Ow.) about the size of a lion, with remarks thereon, by Prof. Owen, F.R.S. The specimens described by the author consist of the fore part of the jaws and the left humerus of a reptile obtained from blocks of Triassic (?) rock from South Africa, forwarded by the late Mr. A. G. Bain. The upper jaw displays a pair of enormous canine teeth much resembling those of *Machairodus*, being of a very compressed form, with the hinder trenchant margin minutely toothed. There is no dentated border to the fore part of the crown. No teeth can be detected in the alveolar border of the right ramus of the lower jaw, which extends about an inch behind the upper canine. In the symphyseal parts of the lower jaw the bases of eight incisors and of two canines are visible, the latter rising immediately in front of the upper ones, to which they are very inferior in size, and being separated by a diastema from the incisors. In this character, as in the number of incisors, the fossil resembles *Didelphys*; and in structure both canines and incisors resemble those of carnivorous mammals. The left humerus is 10½ inches long, but is abraded at both extremities. It presents characters in the ridges for muscular attachment, in the provision for the rotation of the forearm, and in the presence of a strong bony bridge for the protection of the main artery and nerve of the forearm during the action of the muscles, which resemble those occurring in carnivorous mammals, and especially in the Felidae, although these peculiarities are associated with others having no mammalian resemblances. The author discusses these characters in detail, and indicates that there is in the probably Triassic lacustrine deposits of South Africa a whole group of genera (*Galesaurus*, *Cynochampsia*, *Lycosaurus*, *Tigrisuchus*, *Cynosuchus*, *Nythosaurus*, *Scaloposaurus*, *Procolophon*, *Gorgonops*, and *Cynodrakon*), many of them represented by more than one species, all carnivorous, and presenting more or less mammalian analogies, for which he proposes to form a distinct order under the name of Theriodontia, having the dentition of carnivorous type; the incisors defined by position, and divided from the molars by a large lanianiform canine on each side of both jaws, the lower canine crossing in front of the upper, no ectopterygoids, the humerus with an entepicondylar foramen, and the digital formula of the forefoot, 2, 3, 3, 5; 3 phalanges. The author further discussed in some detail the remarkable resemblances presented by these early reptiles, in some parts of their organisation, to mammals, and referred to the broad questions opened out by their consideration. He inquired whether the transference of structures from the reptilian to the mammalian type has been a seeming one, due to accidental coincidence in species independently created, or whether it was real, consequent on the incoming of species by secondary law. In any case the lost reptilian structures dealt with in the present paper are now manifested by quadrupeds with a higher condition of cerebral, circulatory, respiratory, and tegumentary systems, the acquisition of which, the author thought, is not intelligible on either the Lamarckian or Darwinian hypotheses.—On the occurrence of the genus *Astrocrinites* (Austin) in the Scotch Carboniferous Limestone Series, with the description of a new series (*A. ? Bennieii*), and remarks on the genus, by Mr. R. M. Etheridge, jun. The author, in his introduction to the paper, commenced with a general history of the genus *Astrocrinites* of Austin, commenting upon the change of name it had received from the several authors who had written upon and noticed the species *A. tetragonus* of Austin. In 1843 Major T. Austin described this aberrant Echinoderm under the name *Astrocrinites*, assigning its geological horizon to be the Carboniferous Limestone, and locality Yorkshire. Dr. H. G. Bronn rejected the name *Astrocrinites* on account of its resemblance to *Asterocrinites* of Münster, and proposed instead that of *Zygocrinites*. Römer, from the four-rayed structure of our *Astrocrinites*, allied it to the Cystoidea rather than to the Blastoidea. Prof. de Koninck, and M. Je Hon, however, referred *Zygocrinites* to the Blastoidea, and stated their reasons for so doing. Prof. Morris, in 1854, altered Austin's *Astrocrinites* into *Astrocrinus*, and does not notice Bronn's name, *Zygocrinus*. Prof. Pictet provisionally referred the latter genus structurally to *Codonaster*,

¹ Fonvielle (La Science en Ballon Paris, 1869), and elsewhere.

² Bert, Compt. Rend. 1874, 911.

³ Compt. Rend. 1874, 946.

noticing, however, its four instead of five pseudambulacra. The author then notices at some length the species he proposes to call *A. Benniei*, which appears to differ much from Austin's *A. tetragonus*. The body or calyx of *A. Benniei* is tetradial, having four convex lobes, three of which are alike, the fourth differing considerably from the others, the deep re-entering angles between the lobes are occupied by the pseudambulacra, the dorsal surface is densely covered with closely-set tubercles, but shows no point of attachment, the ventral surface is flattened, having a large central aperture, from which radiate the four pseudambulacra; excentric as compared with the ambulacral system is a second and pyriform aperture of complex structure. The component parts are then minutely described, followed by careful descriptions of the pseudambulacra, apertures, and ornamentation, also a discussion as to the presence of a madreporiform tubercle. The second part of the paper treats upon the affinities of *A. Benniei* (Ether.) with *A. tetragonus* (Austin). Part the third enters fully and critically into the systematic position of *Astocrinites* amongst the Cystoidea and Blastoidea. In the concluding and fourth portion of the paper, the localities and geological horizons are given. Twenty-seven figures, occupying three plates, accompanied the paper.—On the genus *Merycochærus* (family Oreodontidae), with descriptions of two new species, by Mr. G. T. Bettany, B.A. Communicated by Prof. T. McKenny Hughes. An account was given of remarkable vertebrate tertiary skulls and other remains brought from Upper Oregon by Lord Walsingham, in 1872, and presented by him to the Woodwardian Museum, Cambridge. The characters of the family of Ungulates (Oreodontidae), to which they belong, and of the genera of the family, were referred to, and supplemented from examination of these remains. The genus *Merycochærus*, previously known only from teeth and portions of jaws, was further defined and described from large skulls and portions of skulls. The remarkable size of the temporal fosse, the form of the zygoma, and especially its great posterior transverse crest, are special points of interest. Finally two new species, *M. temporalis* and *M. Leidyi*, were defined and described.

Meteorological Society, Feb. 16.—Mr. H. S. Eaton, president, in the chair.—Frank C. Capel, Zophar Humphreys, Edward Mawley, Rev. George H. Mullins, William H. Watson, and C. Theodore Williams were elected Fellows of the Society.—The following papers were read:—On an improvement in aneroid barometers, by the Hon. R. Abercromby. The improvement consists in jewelling the ends of the arbor of the index hand like the ordinary pivots of a watch, and making the hand work under the cap instead of in the usual manner. The advantages gained are: (1) increased sensitiveness; (2) increased definiteness of the indications; and (3) diminished influence of weather on the bearings.—Meteorology in India in relation to cholera, by Col. J. Puckle, M.S.C. The author in this paper lays before the Society some facts in connection with several serious outbreaks of cholera in different parts of the Mysore country during the last fifteen years, and draws attention to the similarity of the abnormal meteorological conditions that existed on each occasion. Except in a few of the largest towns in India there are no sewers, and no sewer gas proper. Even in these exceptional towns the drainage is incomplete. The general sanitary arrangements are of the most primitive character. In the rural districts the inhabitants adhere to the Mosaic law, in so far that they go forth to the fields, but they do not carry the "paddle" with them for the purpose that was the exponent of the "dry earth" system; that necessary portion of the work is left to the drying action of a powerful sun, to the kites and other carrion birds, and, *horribile dictu*, to the pigs and poultry that afterwards are doubtless turned into food. In this way it is not difficult to conceive that sewage of the direst and most unadulterated kind may possibly be taken into the system through poisoned meat, or during rainfall it may find its way to open reservoirs or wells; from which two sources the inhabitants depend for their water supply. At other times during the hot, dry weather, when no rain falls, malaria may arise and be distributed through the agency of the atmosphere. Notwithstanding all that has been said and done, the clue to the mystery of the origin of the disease remains undiscovered. It is the same with the treatment. Remedies that at one time appeared to be most effectual have, at another, most signally failed. Even during the same attack, the same remedy that cured one person would fail in another, even where the same conditions apparently existed. Failure of the usual rainfall at the proper time, and abnormally

high and harsh temperature, have been concurrent with several attacks in Mysore and Southern India. At such times the open reservoirs or lakes and wells are much below the usual spring level, and any contamination received at such a time is obviously much less diluted, and more harmful. The author then gives an account of several attacks that have come under his own personal knowledge, which shows beyond doubt that the disease has been arrested by change of air and surroundings, and that ordinary sanitary practice has prevented a possible outbreak. After referring to the recent outbreaks at Bangalore and Madras the author says that everywhere the same story is told of the occurrence of cholera coincident with long absence of rain and a temperature abnormally high.—On sixteen months' rain at Bristol, by W. F. Denning.

Entomological Society, Feb. 2.—Sir Sidney Smith Saunders, C.M.G., vice-president, in the chair.—Mr. McLachlan directed attention to an article by M. Flaminio Baudi in the *Petites Nouvelles Entomologiques*, respecting the habits of *Cyclus cylindricollis*, which he had taken on Monte-Codeno, feeding on the body of a snail (*Helix frigida*), into the spiral of which the beetle was enabled to enter by means of its long prothorax. Some interesting remarks were made by Mr. Bates and others on the peculiar structure and habits of the insect, which appeared to have been found only on a very sterile portion of the plateau of the mountain, and in no other part.—A valuable paper was communicated by Dr. D. Sharp, entitled "Contributions to an Insect-Fauna of the Amazon Valley (Staphylinidae)." Of this important group of Coleoptera, 487 species were enumerated as inhabiting the valley, of which 463 were described as new; suggesting forcibly how little is really known of the Staphylinidae of Tropical America. Dr. Sharp also stated that he had devised a method of covering and hermetically sealing the type specimens which, he believed, would accomplish their almost complete preservation, and that he hoped soon to be able to publish a description of the method. The author concluded with remarking on the great importance of certain sexual characters in distinguishing the species.

Institution of Civil Engineers, Feb. 15.—Mr. Geo. Robt. Stephenson, president, in the chair.—The paper read was on estimating the illuminating power of coal gas, by Mr. William Sugg, Assoc. Inst. C.E.

EDINBURGH

Royal Society, Feb. 21.—Prof. Kelland, vice-president, in the chair.—The following communications were read:—On the structure of the body-wall in the Spionidae, by Dr. W. C. McIntosh.—On circular crystals, by E. W. Dallas.—Preliminary note on the flame produced by putting common salt in the fire, by C. M. Smith; communicated by Prof. Tait.

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